REMARKS

This is in response to the Office Action dated June 8, 2007.

I. Summary of the Office Action

In the Office Action, Claims 1-7 were objected to under 35 U.S.C. § 112, Second Paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In addition, Claims 1-3 were rejected under 35 U.S.C. § 103(a), as being unpatentable over Lee, United States Patent Publication No. 2005/0274119, published on December 15, 2005 ("Lee") in view of Larsson, et al., United States Patent No. 5,588,300, issued on December 31, 1996. Claims 1-3 were also rejected under 35 U.S.C. § 103(a), as being unpatentable over Ishida, et al., United States Patent No. 6,173,576 issued on January 16, 2001("Ishida") in view of Larsson. Claims 1-4 and 8-9 were rejected under 35 U.S.C. § 103(a), as being unpatentable over Erler, et al., United States Patent No. 5,704,212 issued on January 6, 1998 ("Erler") in view of Larsson. Claims 5-7 and 10-13 were rejected under 35 U.S.C. § 103(a), as being unpatentable over any one of Lee, Ishida or Erler, in view of Larsson as applied to Claims 1-3, and further in view of Balzano, United States Patent No. 6,257,329 ("Balzano").

Claim 14 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all the limitations of the base claim and any intervening claims.

II. Claim Rejections

A. Rejection under 35 U.S.C. § 112

Independent Claim 1 was objected to under 35 U.S.C. § 112, Second Paragraph, based on a contention that "said diode array" lacked antecedent basis. Dependent Claims 2-7 were also objected to under 35 U.S.C. § 112, Second Paragraph, for depending from Claim 1.

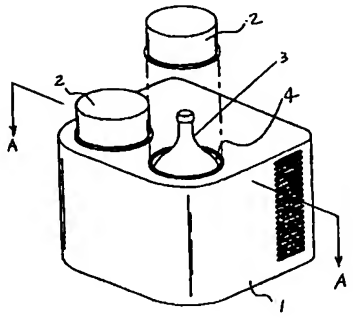
By the present amendment, the Applicant has eliminated the language to which the Examiner has objected. Thus, upon entering of this amendment, Applicant believes the stated reason for the above-identified objection has been overcome.

B. Rejections under 35 U.S.C. § 103(a)

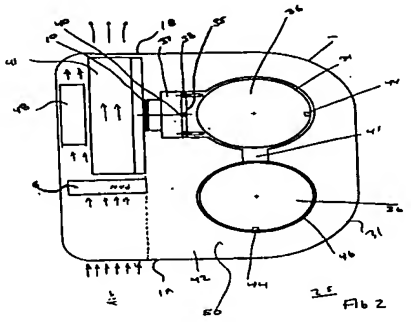
1. Lee in view of Larsson

Claims 1-3 were rejected under 35 U.S.C. § 103(a), as being unpatentable over Lee in view of Larsson.

As understood by Applicant, Lee discloses a thermoelectric chiller and warmer which can increase or decrease the temperature of a contained liquid or solid and liquid combination such as a bottled or canned liquid and/or solid. *Lee, Abstract; See also Figure 1.* Figures 1 and 2 of Lee reproduced below represents the thermoelectric chiller and its operation.



Lee, Fig. 1



Lee, Fig. 2

Specifically, the ambient air is drawn by a fan 6 from a first side of the main body 1 and discharged from the second side. *Lee, Paragraph [0032].* The cooling cylinder 34 is used for placement of a bottle of wine for the purpose of chilling the same. *Id.* The cylinder has side and bottom walls that are made of a thermally conductive material, such as Aluminum or Copper. *Id.* A contact area 35 is adjacent to the cylinder 34 and also in contact with a thermally conductive spacer 37. *Id.* A thermoelectric module 10 is located between the spacer 37 and a heat sink 41. *Id.* The thermoelectric module is a solid state heat pump that consists of numerous N-type and P-type semiconductor pairs that are connected in series and placed between two ceramic substrates. *Id.* When power is applied through the semiconductor pairs, one of the ceramic substrates reduces in temperature while the other increases in temperature demonstrating a heat pumping/transfer action from the cold ceramic substrate to the hot ceramic substrate. *Id.* The cold ceramic substrate absorbs heat from the spacer 37 then from the cylinder 34. *Id.* The sum of the input power and the thermal energy transferred from the cooling cylinder 34 is dissipated from the heat sink 41 with the help of the fan 6.

As understood by Applicant, Larsson teaches a device for regulating the temperature in a room. *See, Larsson, Figure 1.* Larsson is primarily directed to the use of a refrigerated room that is internal to a boat, such as in the hull, the room having a lid and walls made of insulating foam and an aluminum shell surface.

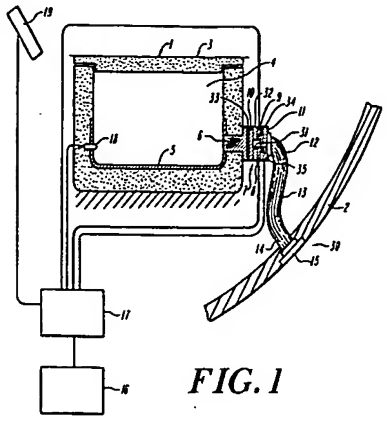


FIG. 1

Larrson, Fig. 1

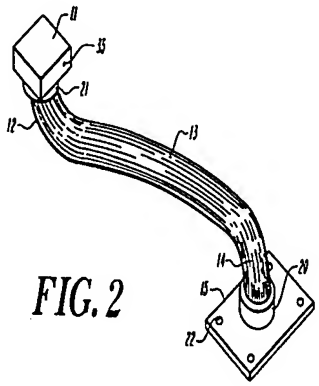


FIG. 2

Larrson, Fig. 2

As shown in Figure 1 of Larrson reproduced above, the device comprises a thermo-electric cooling element 7 connected by a first end 8 to the room through a first heat conducing element, a means 16 connected to the thermo-electric cooling element 7 and adapted to cause an electric current to flow through the cooling element 7 and a second heat conducting heat element connected to the opposite, second end 10 of the cooling element and adapted to be in contact with a medium 30 for exchange of heat therewith controlled by the electric current through said thermo-electric cooling element. *Larrson, Abstract.*

More specifically, Larrson consists of two heat conducting elements, with the first consisting of an aluminum shell and a rigid projection extending therefrom. *Larrson, Col. 4, Lns. 31-33.* The rigid projection extends out through the insulating wall of the refrigerator and has a thermoelectric cooling element rigidly connected thereto. *Id.* The thermoelectric element is a conventional design having two metal pieces 8, 9 of the same metal and one piece of a different type of metal connecting the pieces 8, 9 through two semi conductors 31, 32. *Larrson, Col. 3, Lns. 25-30.* Two junctions are obtained when an electric voltage is applied between the two metal pieces 8,9 as one of the junctions becomes warm and the other cold which achieves a heat transfer from one side of the thermo-electric cooling element to the other. *Id., Col. 3, Lns. 35-40.* The second heat conducting element is shown in Figure 2,

reproduced above and consists of the copper block 11, a bundle of copper wires 13 and a copper plate 15 which is attached to the hull of the boat. *Id., Col. 4, Lns. 33-35.*

Applicant's Independent Claim 1, as amended, a multi-stage directional heat transferring enclosure having an open-ended passageway, the passageway defining first and second ends, each of said stages separated by an insulator; a plurality of solid state devices thermally coupled to said heat source and said heat transferring enclosure, at least one said solid state device associated with a stage of said heat transferring enclosure for conductive transfer of heat energy from said solid state devices into said open ended passageway; and a blower disposed at the first end of said passageway forcing heat energy into and through said passageway to the second end of the passageway.

Neither the Lee reference nor the Larrson reference discloses or teaches a multi-stage directional heat transferring enclosure having an open-ended passageway, the passageway defining first and second ends, each of said stages separated by an insulator. Further, there is no motivation in the individual references or based on the knowledge of one skilled the art to combine the references or modify the teachings produce the same. As understood, Lee does not involve stages, but rather uses a single stage structure in the form of a heat sink to dissipate the heat energy. In support thereof, Applicant respectfully directs the Examiner's attention to Page 2, Paragraph 0032, as well as exemplary Figure 2. The specification of Lee states that "the thermal energy transferred from the cooling cylinder is dissipated from the heat sink with the help of a fan." Lee, Paragraph [0032]. Thus, Lee appears to only disclose the use of a single stage to dissipate heat energy, rather than multiple stages as required by the Applicant's claimed invention.

Larsson also does not disclose such heat transference stages. Instead, Larsson focuses on the use of a thermal cable connecting a heat source to a wall, such as a boat's hull, to readily cool the heat source without the use of power draining compressors. The cooling element disclosed in Larsson does not involve stages. Rather, a single copper plate is connected to the thermo-electric cooling element to conduct heat.

Further, Lee does not teach or suggest "*the plurality of solid state devices disposed on the heat transferring enclosure and thermally coupled to said heat source and said heat transferring enclosure, at least one said solid state device associated with a stage of said heat*

transferring enclosure for conductive transfer of heat energy from said solid state devices into said open ended passageway." Instead, the cooler 26 of Lee appears to utilize the Peltier effect and two dissimilar metals, rather than a plurality of diodes, to obtain the desired cooling. As understood, at the junction of the metals, heat is either evolved or absorbed depending on the flow of current. In this way, by switching the polarity of the DC electrical power, the chiller can become a warmer, or vice versa.

Therefore, the cooler 26 in Lee cannot include a plurality of diode arrays because the diodes would restrict the flow of current to a single direction, preventing cooler 26 from switching from a chiller to a warmer. Furthermore, there is no motivation to modify the Lee reference such that the thermoelectric cooler uses a plurality of diode arrays. As discussed above, because the invention in Lee can act as a chiller and a warmer, using diodes within the thermoelectric cooler would prevent the device in Lee from being able to heat and cool, as heat transfer would be limited to a single direction. Thus, there is no motivation to modify the Lee device to include a plurality of diode arrays because such modification would seemingly make the Lee device at least partially inoperable for its intended use.

As neither the Lee reference nor the Larrson reference teach or suggest the limitations of Independent 1 and there is no motivation in the individual references to combine the teachings and produce the same, a prima facie case of obviousness has not been established and Independent Claim 1 is allowable over the cited prior art. Further, dependent Claims 2-3 are either directly or indirectly dependent on Independent Claim 1 and are allowable for the reasons given above with respect to Independent Claim 1.

2. Ishida in view of Larsson

Claims 1-3 are rejected under 35 U.S.C. § 103(a), as being unpatentable over Ishida in view of Larsson.

The Applicant's understanding of Larsson is set forth above. As understood by the Applicant, Ishida teaches a cooling unit for an integrated circuit package. *Ishida, Col. 2, Lns. 9-11.* The cooling unit includes a base plate 16 that is attached to the integrated circuit package 12, the base plate 16 being constructed from a thermally conductive material such as copper or aluminum. *Ishida, Col. 2, Lns. 15-18.* The cooling unit 10 may further have a plurality of Peltier

devices 18 that are mounted to the base plate 16 which remove heat in proportion to a current that is provided to the cooling unit 10. *Id., Lns. 17-21.* Each of the Peltier devices 18 are adequately spaced 20 from each other. *Id.* The cooling unit 10 may further have a plate 24 which is mounted on the Peltier devices 18 and a heat sink having fins 22 mounted on the plate 24. *Id., Lns. 24-27.* The fins 22 of the heat sink and the plate 24 are also constructed from a thermally conductive material such as aluminum or copper to draw the heat from the Peltier devices 18. *Id., Lns. 26-28.* As power is provided to Peltier devices, the device pumps heat from the integrated circuit. The fan then circulates air over the heat sink and the Peltier devices to absorb the collected heat which is then dissipated from the cooling unit. *Id. 36-38.*

Neither the Ishida reference nor the Larrson reference teaches or suggests ***a multi-stage directional heat transferring enclosure having an open-ended passageway, the passageway defining first and second ends, each of said stages separated by an insulator***. Further, there is no motivation in the individual references or based on the knowledge of one skilled the art to combine the references or modify the teachings produce the same. As understood by the Applicant and set forth above, Ishida does not involve stages, but rather uses a single cooling unit to remove heat. Ishida discloses only a single stage cooling unit that utilizes Peltier devices 18 attached to a base plate 16 and a heat sink. *See, Ishida, Col. 2, Lns. 15-34; Figures 1-2, 5-7.* Heat is conducted through the base plate 16 to the Peltier devices 18 and the fins 22 of the heat sink. The fan causes air to pass over the Peltier devices and the fins of the heat sink causing the heat to be absorbed therefrom.

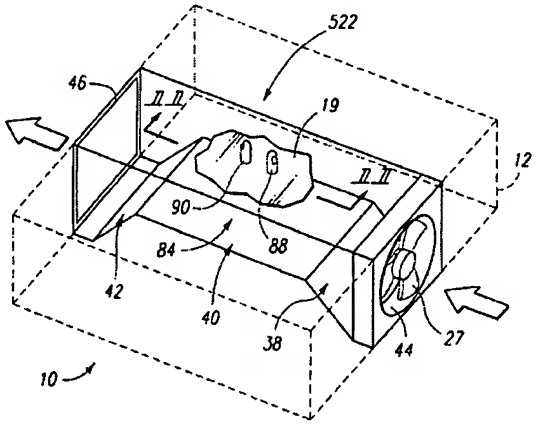
As neither the Ishida reference nor the Larrson reference teach or suggest the limitations of Independent 1 and there is no motivation in the individual references to combine the teachings and produce the same, a prima facie case of obviousness has not been established and Independent Claim 1 is allowable over the cited prior art. Further, dependent Claims 2-3 are either directly or indirectly dependent on Independent Claim 1 and are allowable for the reasons given above with respect to Independent Claim 1.

3. Erler in view of Larsson

Claims 1-4 and 8-9 are rejected under 35 U.S.C. § 103(a), as being unpatentable over Erler in view of Larsson.

Applicant's understanding of Larsson is set forth above. As understood by the Applicant, Erler teaches a cradle assembly having a base with a mounting surface configured to receive a portable electronic device. *Erler, Abstract.* The cradle assembly has a cooler supported by the base to facilitate the use of the portable electronic device in warm, or harsh thermal environments, as the cooler is operable to dissipate heat from the portable electronic device when the device is placed on the cradle. *Id., Col. 1, Lns. 57-59.* The cooler is constructed as a Peltier effect thermoelectric cooler which allows for heat to be absorbed at the junction of two dissimilar metals while carrying a small current such that heat may either be evolved or absorbed depending upon the direction of the applied current. *Id., Col. 5, Lns. 22-25.*

As shown in Figure 12, Erler discloses inlet ports that extend vertically upwardly of surface 19 for mating with a portable electronic device that is received on top of the cradle 10. *Id., Col. 11, Lns. 16-20.*



Erler, Figure 12.

A fan 27 draws cooling or heating fluid into the inlet port 44, inlet duct 38, throat duct 40 and outlet duct 42 where it exhausts through outlet port 46. *Id., Lns. 20-26.* A source of cooling air driven by a fan 27 from outside the cradle provides direct cooling of the interior of a portable electronic device by ducting cooling fluid through the device. *Id., Lns. 23-26.* The surface 19 is cooled by the flow of cooling fluid through the throat duct 40 which further contributes to cooling of the bottom of the portable electronic device when mated on the cradle 10. *Id., Lns. 26-30.*

Applicant's claim 1 requires a solid state thermal apparatus comprising: a heat source; a heat transferring enclosure having an open-ended passageway and arranged in a plurality of stages, each of said stages separated by an insulator; a plurality of solid state devices disposed on said heat transferring enclosure and thermally coupled to said heat source and said heat transferring enclosure, at least one said solid state device associated with a stage of said heat transferring enclosure for conductive transfer of heat energy from said solid state devices into said open ended passageway; and a blower disposed at a first end of said passageway forcing heat energy into and through said passageway to a second end of the passageway.

Applicant respectfully states that Erler in view of Larsson does not teach or suggest all of the claimed limitations of Independent Claim 1. In particular, Erler does not disclose ***a multi-stage directional heat transferring enclosure having an open-ended passageway, the passageway defining first and second ends, each of said stages separated by an insulator.*** Moreover, there is no motivation to modify Erler to include a plurality of heat transference stages insulated from each other due to the nature and layout of the Erler invention. The addition of insulated heat transference stages would either increase the total surface area of the cooler assembly, or decrease the actual cooler surface area due to the limited space of the cooler assembly. Furthermore, due to the apparent position of the cooler in abutting relationship with the heat source, any addition of insulation between coolers would decrease the proportion of the surface area of the coolers that is in contact with the heat source. Thus, the addition of such insulation would seem to reduce the effectiveness of the cooler.

Erler also does not disclose ***a plurality of solid state devices disposed on said heat transferring enclosure.*** Similar to the Lee device, the Erler device also may also be used as a chiller and warmer. In addition, Erler also appears to utilize two dissimilar metals and the Peltier effect to transfer heat from one metal to the other. The Erler device requires the ability to heat or cool the coupled portable electronic device. Thus, a plurality of diode arrays would seemingly inhibit such a use for the reasons mentioned above with regard to the Lee device.

As neither the Erler reference nor the Larrson reference teach or suggest the limitations of Independent 1 and there is no motivation in the individual references to combine the teachings and produce the same, a prima facie case of obviousness has not been established and Independent Claim 1 is allowable over the cited prior art. Further, dependent Claims 2-4 are

either directly or indirectly dependent on Independent Claim 1 and are allowable for the reasons given above with respect to Independent Claim 1.

Applicant's claim 8 requires a solid state thermal apparatus for dissipating heat from a heat source comprising: a multistage, directional heat transferring enclosure defining an open-ended passageway and a plurality of successive heat transference stages, each stage insulated from each other; an array of panels, each panel carrying a plurality of diodes and the plurality of diodes thermally coupled to said heat source, the array of panels carried on the exterior of said heat transferring enclosure and disposed immediately adjacent to a respective heat transference stage for conducting heat energy from said array of panels to said heat transference stages for conductive transfer of heat energy into said open-ended passageway;

As previously described with respect to Independent Claim 1, Erler does not disclose a multi-stage directional heat transferring enclosure having an open-ended passageway, the passageway defining first and second ends, each of said stages and separated by an insulator. As neither the Erler reference nor the Larrson reference teach or suggest the limitations of Independent 8 and there is no motivation in the individual references to combine the teachings and produce the same, a prima facie case of obviousness has not been established and Independent Claim 8 is allowable over the cited prior art. Further, dependent Claim 9 is directly dependent on Independent Claim 8 and is allowable for the reasons given above with respect to Independent Claim 8.

4. Lee, Ishida or Erler, in view of Larsson and further in view of Balzano

Dependent Claims 5-7 and 10-13 were rejected under 35 U.S.C. § 103(a), as being unpatentable over the Lee, Ishida or Erler, in view of Larsson and further in view of Balzano. The claims are believed to be in condition for allowance for being dependent upon an allowable base claim.

New Claims

By this amendment, Applicant adds new Claims 15-17. Claim 15 further defines the plurality of stages in Claim 1 as being arranged in a stacked arrangement. Support for this new claim can be found in Figure 2. Claim 16 further defines the carbon graphite composition in

Claim 5 as being heat conductive directional. Support for this amendment can be found in the Applicant's Specification on Pages 5, 7 and 9, as well as Figure 1. Claim 17 is an independent claim incorporating the limitations of Claims 8 and 10-14. Applicant submits that Claims 15-18 are believed to be in condition for allowance for the reasons discussed above. Applicant also submits that no new matter has been added by the addition of these claims.

CONCLUSION

Applicant respectfully submits that Claims 1-10 and 12-17 are now in condition for allowance. An early notice of allowance is therefore respectfully requested. Should the Examiner have any suggestions for expediting allowance of the above-identified application, the Examiner is invited to contact Applicant's representative at the telephone number listed below.

If any additional fee is required, please charge Deposit Account Number 19-4330.

Respectfully submitted,

Date: Dec 8, 2007 By: _____

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